Journal of Physics: Conference Series 2017 vol.927 N1

Interface layer formed in a low-temperature plasma of hydrocarbons on iron

Lyakhovich A., Shakov A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© Published under licence by IOP Publishing Ltd. The method of uncovering the interphase layer in the systems "iron-nanosized polymer film" obtained in a low-temperature plasma on iron from hydrocarbons was used. A method of interface layer uncovering based on electrochemical dissolution of the iron substrate was proposed, which allowed one to achieve a high rate of metal. Ammonium sulfate solution was used as an electrolyte. A method of interface layer uncovering based on electrochemical dissolution of the iron substrate was proposed in the work. This allowed one to achieve a high rate of metal dissolution and make it possible to control the composition of the dissolution product. Salt solution was used as an electrolyte. Interface layer studies were carried out using the AFM and XPS methods, which allowed establishing the relief and chemical composition of the interphase boundary, as well as the location on the interphase surface of the metal-containing phase. The application of a double-layer iron substrate consisting of a plate of 56 Fe nonresonance isotope with a 57 Fe ultrafine layer deposited on its surface allowed one to use the Mössbauer spectroscopy for investigation of the chemical state of iron atoms in the interfacial region of "iron-nanoscale polymer film" systems.

http://dx.doi.org/10.1088/1742-6596/927/1/012084

References

[1] Lyakhovich A M, Lyalina N V and Reshetnikov S M 2010 Protection of Metals and Physical Chemistry of Surfaces 46 666
[2] Lyakhovich A M 2014 High Energy Chemistry 48 54
[3] Lyakhovich A M, Shakov A A, Lyalina N V and Elsukov E P 2014 Protection of Metals and Physical Chemistry of Surfaces 50 884
[4] Nefedov V I 1984 X-Ray Electron Spectroscopy of Chemical Compounds (Moscow: Khimiya) 160
[5] Maksimov Yu V, Suzdalev I P and Arents R A 1972 Solid state physics 14 3344
[6] Sej J O, Cook D C and Townsend H E 1998 Hyperfine Interact 112 59